



Digital I/O

CYPDISO 8P

**PCI-Bus 8-Channel
Isolated Interface Board**

USER'S MANUAL

VER. 6 • APRIL 2002

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1.0 INTRODUCTION

1.1 DESCRIPTION

The CyPDISO 8P has eight isolated input channels and eight relay-output channels. It is made to interface with PCI-compatible computers. The CyPDISO 8P is used for control and sensing applications where high voltage are to be sensed or controlled.

WARNING!

High voltages will be present on the CyPDISO 8P board when you have connected high voltage inputs or outputs to the PDISO8 connector. Use extreme caution! Never handle the CyPDISO 8P when signals are connected to the board through the connector.

DO NOT REMOVE THE PROTECTIVE PLATES FROM THE CyPDISO 8P.

The inputs are eight individual, optically-isolated (500V) inputs that can be read back as a single byte. The inputs are not polarity sensitive and may be driven by either AC (50 - 1000 Hz) or DC. Each input has a programmable low-pass filter with a time constant of 5 ms (200 Hz).

The outputs are eight, electromechanical relays. Five relays provide Form-C connections and three provide normally-open Form-A connections. The relays are controlled by writing to an 8-bit port. The relay control register can be read back from the same port.

The CyPDISO 8P is compatible with the optional Universal Library software package.

1.2 ACCESSORIES

The CyPDISO 8P is a combination digital I/O board with signal conditioning installed. Most accessory boards are intended to provide signal conditioning or easy to access signal termination. In general, the CyPDISO 8P will not require additional signal conditioning.

We recommend that screw terminal boards not be used with the CyPDISO 8P if using field voltages greater than 24 volts. If you use a screw terminal board with high voltage inputs or outputs, you will expose yourself and others to those high voltage signals. We recommend that you construct a safe cable to carry your signals directly from your equipment to the CyPDISO 8P connector.

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2.0 SOFTWARE INSTALLATION

Before installing the CyPDISO 8P, first install the *InstaCal*™ installation, calibration and test utility included with your board. You can install *InstaCal* from either the *InstaCal* disk set or from the optional Universal Library™, if ordered.

InstaCal creates a configuration file that your application software (and the Universal Library) refers to, so your software automatically accesses the exact configuration of the board. For information on the installation and operation of *InstaCal*, refer to the *Software Installation Manual*.

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3.0 HARDWARE INSTALLATION

The CyPDISO 8P is completely plug-and-play. There are no manually configured options. Simply install the board and run *InstaCal* to verify proper installation.

3.1 INSTALLING THE HARDWARE

1. Power OFF your computer and remove the cover.
2. Insert the CyPDISO 8P securely into any available PCI slot. Make sure the board is properly seated in the slot or damage to your PC or board could result.
3. Replace the cover and power ON your computer.
4. Run *InstaCal* to configure your board and test the installation

3.2 AC INPUT FILTER

The inputs are eight individual, optically isolated (500V) inputs that may be read back as a single byte. The inputs are not polarity sensitive and may be driven by either AC (50-1000 Hz) or DC. Each input has a software enabled/disabled low-pass filter with a time constant of 5 ms (200 Hz).

The input filters are described and set by *InstaCal*. The filter must be used for AC inputs and should be used for almost all DC inputs. Unless you have reason to turn off a filter, you should enabled it.

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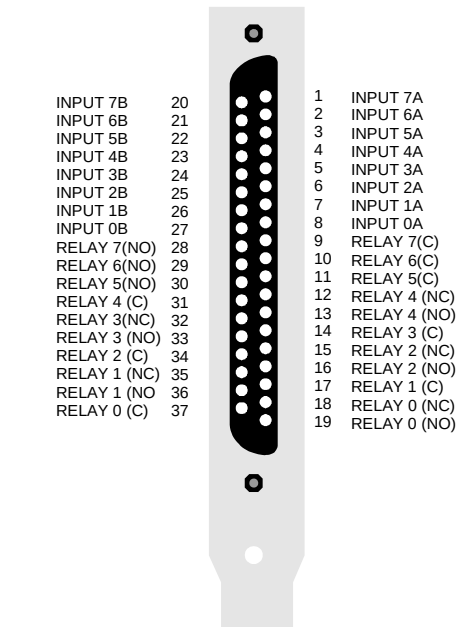
4.0 INTERFACING

This short introduction to the electronics most often needed by digital I/O board users covers the following:

- Connector diagram.
- FORM C relay outputs.
- FORM A relay outputs.
- Isolated inputs.
- Adding a resistor to expand the range of the isolated inputs.
- Voltage dividers.

4.1 CONNECTOR DIAGRAM

The CyPDISO 8P use a single 37-pin connector.



37 PIN CONNECTOR - (NO) = Normally Open, (C) = Common, (NC) = Normally Closed.

Figure 5-1. 37-Pin Board Connector

WARNING!

High voltages will be present on the CyPDISO 8P board when you have connected high voltage inputs or outputs to the CyPDISO 8P connector. Use extreme caution! Never handle the CyPDISO 8P when signals are connected to the board through the connector.

**DO NOT REMOVE THE PROTECTIVE PLATES
FROM THE CYPDISO 8P BOARD.**

4.2 FORM C RELAY OUTPUTS

Figure 5-2 is the schematic for a form C relay, like those connected at RELAY 0 through RELAY 4.

The form C relay has a COMMON, normally open (NO) and normally closed (NC) contact.

When a 0 is written to the output, the common and NC are in contact. When a 1 is written to the output the common and NO are in contact.

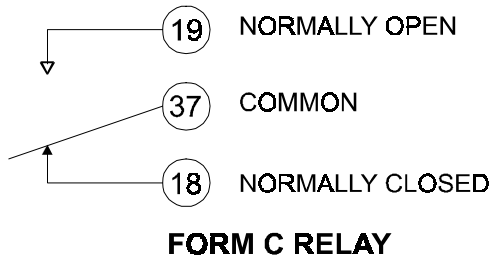


Figure 5-2. Form C Relay (0) Contacts

4.3 FORM A RELAY OUTPUTS

Shown here is the schematic for a form A relay, like those connected at RELAY 5 through RELAY 7.

The form A relay has a COMMON and a normally open (NO) contact.

When a 0 is written to the output, the common and NO are NOT in contact. When a 1 is written to the output the common and NO are in contact.

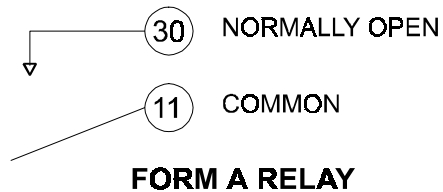


Figure 5-3. Form A Relay (5) Contacts

The form A and form C relays on the CyPDISO 8P are the same type. Only the connections to the relay poles differ.

4.4 ISOLATED INPUTS

The CyPDISO 8P board has are eight isolated input channels. The schematic of a single channel is shown in Figure 4-4.

The signals are routed through a bridge rectifier so that the inputs are not polarity sensitive.

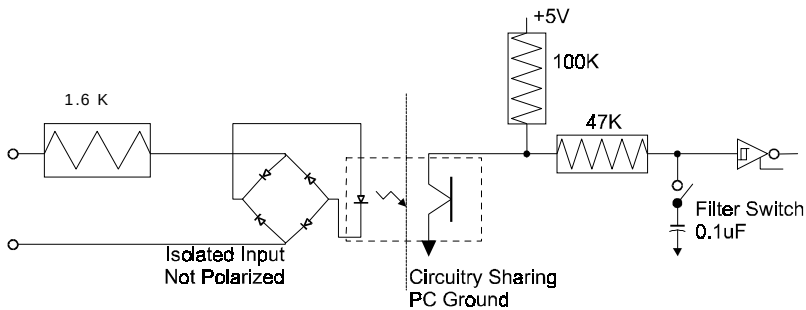


Figure 5-4. Isolated Input Schematic- Simplified

4.5 EXTENDING THE INPUT RANGE

To extend the input range beyond the 5-28V specified, add an external resistor. Figure 4-5 shows the resistor and the equations used to calculate resistor values for a given V_{in} .

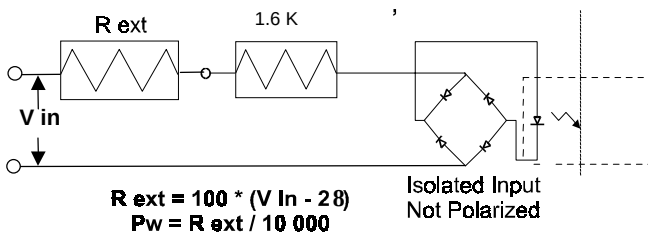


Figure 5-5. Input Range-Extending Resistor

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5.0 SPECIFICATIONS

Power Consumption

+5V

All Relays Off

0.4A typical

All Relays On

1.0A typical

Relay Specifications

Number

8

Contact Configuration

5 form C, relay 0 to relay 4

3 form A, relay 5 to relay 7

Contact Rating

6A @ 120VAC or 28VDC resistive

Contact Type

Gold-overlaid silver

Contact Resistance

100 milliohms max.

Operate Time

20 milliseconds

Release Time

10 milliseconds max.

Vibration

10 to 55 Hz (Dual amplitude 1.5mm)

Shock

10G (11 milliseconds)

Dielectric Isolation

500V (1 minute)

Life Expectancy

10 milliohm mechanical operations, min.

Isolated Inputs

Number

8

Voltage Range

DC

5 to 28V (Not TTL compatible)

AC

5 to 28V (50 to 1000 Hz)

Isolation

500V

Resistance

1.6k Ohms min

Response

w/o Filter

20 μ s

w/ Filter

5 ms

Filters

Time Constant

5 ms (200 Hz)

Filter Control

Each input individually programmable

Power-Up /Reset

Filters off

Environmental

Operating Temperature Range

0 to 70°C

Storage Temperature Range

-40 to 100°C

Humidity

0 to 90%, non-condensing

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EC Declaration of Conformity

We, the manufacturer, declare under sole responsibility that the product:

CYPDISO 8P

Isolated input/relay output interface board for the PCI bus

Part Number

Description

to which this declaration relates, meets the essential requirements, is in conformity with, and CE marking has been applied according to the relevant EC Directives listed below using the relevant section of the following EC standards and other informative documents:

- EU EMC Directive 89/336/EEC: Essential requirements relating to electromagnetic compatibility.
- EN 55022 Class B (1995): Radiated and conducted emission requirements for information technology equipment.
- ENV 50204 (1995): Radio-frequency electromagnetic field immunity
- EN 55024 (1998): EC generic immunity requirements.
- EN 50082-1 (1997): EC generic immunity requirements.
- EN 61000-4-2 (1995): Electrostatic discharge immunity.
- EN 61000-4-3 (1997) ENV 50204 (1996): RF immunity.
- EN 61000-4-4 (1995): Electric fast transient burst immunity.
- EN 61000-4-5 (1995): Surge immunity.
- EN 61000-4-6 (1996): Radio frequency common mode immunity.
- EN 61000-4-8 (1994): Power frequency magnetic field immunity.
- EN 61000-4-11 (1994): Voltage dip and interrupt immunity

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Product Service

Diagnosis and Debug

CyberResearch, Inc. maintains technical support lines staffed by experienced Applications Engineers and Technicians. There is no charge to call and we will return your call promptly if it is received while our lines are busy. Most problems encountered with data acquisition products can be solved over the phone. Signal connections and programming are the two most common sources of difficulty. CyberResearch support personnel can help you solve these problems, especially if you are prepared for the call.

To ensure your call's overall success and expediency:

- 1) Have the phone close to the PC so you can conveniently and quickly take action that the Applications Engineer might suggest.
- 2) Be prepared to open your PC, remove boards, report back-switch or jumper settings, and possibly change settings before reinstalling the modules.
- 3) Have a volt meter handy to take measurements of the signals you are trying to measure as well as the signals on the board, module, or power supply.
- 4) Isolate problem areas that are not working as you expected.
- 5) Have the source code to the program you are having trouble with available so that preceding and prerequisite modes can be referenced and discussed.
- 6) Have the manual at hand. Also have the product's utility disks and any other relevant disks nearby so programs and version numbers can be checked.

Preparation will facilitate the diagnosis procedure, save you time, and avoid repeated calls. Here are a few preliminary actions you can take before you call which may solve some of the more common problems:

- 1) Check the PC-bus power and any power supply signals.
- 2) Check the voltage level of the signal between SIGNAL HIGH and SIGNAL LOW, or SIGNAL+ and SIGNAL- . It CANNOT exceed the full scale range of the board.
- 3) Check the other boards in your PC or modules on the network for address and interrupt conflicts.
- 4) Refer to the example programs as a baseline for comparing code.

Warranty Notice

CyberResearch, Inc. warrants that this equipment as furnished will be free from defects in material and workmanship for a period of one year from the confirmed date of purchase by the original buyer and that upon written notice of any such defect, CyberResearch, Inc. will, at its option, repair or replace the defective item under the terms of this warranty, subject to the provisions and specific exclusions listed herein.

This warranty shall not apply to equipment that has been previously repaired or altered outside our plant in any way which may, in the judgment of the manufacturer, affect its reliability. Nor will it apply if the equipment has been used in a manner exceeding or inconsistent with its specifications or if the serial number has been removed.

CyberResearch, Inc. does not assume any liability for consequential damages as a result from our products uses, and in any event our liability shall not exceed the original selling price of the equipment.

The equipment warranty shall constitute the sole and exclusive remedy of any Buyer of Seller equipment and the sole and exclusive liability of the Seller, its successors or assigns, in connection with equipment purchased and in lieu of all other warranties expressed implied or statutory, including, but not limited to, any implied warranty of merchant ability or fitness and all other obligations or liabilities of seller, its successors or assigns.

The equipment must be returned postage prepaid. Package it securely and insure it. You will be charged for parts and labor if the warranty period has expired.

Returns and RMAs

If a CyberResearch product has been diagnosed as being non-functional, is visibly damaged, or must be returned for any other reason, please call for an assigned RMA number. The RMA number is a key piece of information that lets us track and process returned merchandise with the fastest possible turnaround time.

PLEASE CALL FOR AN RMA NUMBER!

Packages returned without an RMA number will be refused!

In most cases, a returned package will be refused at the receiving dock if its contents are not known. The RMA number allows us to reference the history of returned products and determine if they are meeting your application's requirements. When you call customer service for your RMA number, you will be asked to provide information about the product you are returning, your address, and a contact person at your organization.

Please make sure that the RMA number is prominently displayed on the outside of the box.

• Thank You •

